ABSTRACT OF THE DISCLOSURE

An improved adaptive line enhancer includes an adaptive Gray-Markel lattice notch filter having an adaptive notch

5   frequency, in which the notch frequency is determined according to a notch frequency variable k. The value of k for the $n+1^{th}$ sample period is determined according to the following equation:

$$k(n+1) = k(n) - \text{sgn}[y(n)]\text{sgn}[UPDATEFN] \times \mu$$

in which y(n) is the notch filter output, μ is the adaptation

10 constant, and UPDATEFN has a transfer function in the z-transform domain of:

$$\frac{(\alpha-1)(k(n)-1)z^{-1}}{1+k(n)(1+\alpha)z^{-1}+\alpha z^{-2}}$$

15 in which α determines the bandwidth and k(n) is a variable for determining the current notch frequency. The algorithm for adapting the notch frequency enables the notch frequency to be directly calculated from knowledge of internal variables of the wave digital filter.